

*“To Accomplish Great Things One  
Must Not Only Dream, But Act”*

*~Bill Blackman*

# Summer Internship Presentation

**Presented By:**

**Brittani J. Sims**

**Internship Experience:**

Launch: June 4, 2007

Landing: August 10, 2007



# Overview

- Background
- Project Responsibilities
- Investigation/ Analysis of Unscheduled Outages
  - Goal Six Metric Review
- Fire Alarm / Suppression System Metrics Surveillance
  - 2.2.1-3, False Alarms and Evacuations
  - 2.2.1-13, Preventive Maintenance of Fire Alarms Systems
- Fire Alarm / Suppression Systems Availability
  - Fire Alarm and Suppression Systems Impairment Report
- Brittani's Prospective NOW
- Acknowledgements
- Questions



# Background

- Attend Morgan State University
  - Located in North East Baltimore, Maryland
- Senior, Electrical & Computer Engineering Major
- Native of San Diego, California
- 2006 -2007 NASA MUST Scholar
- Future Astronaut



# Project Responsibilities

## ■ Investigation/Analysis of Unscheduled Outages

Review and Understand Goal Six Metric

- Provide a Conclusion of whether the contractor is providing the government a good product regarding the services and determination of “availability” criteria.

## ■ Fire Alarms / Surveillance

### 2.2.1-3 False Fire Alarms

- Verify that E&I is

### 2.2.1-13 Preventing False Alarms

- Deferral Procedure

- Verify how E&I is working with the customer in coordinating these with the contractor.

- Reflection of the contractor's performance in appropriately

## ■ Fire Alarm/Suppression Systems

Fire Alarm and Suppression System Management Report

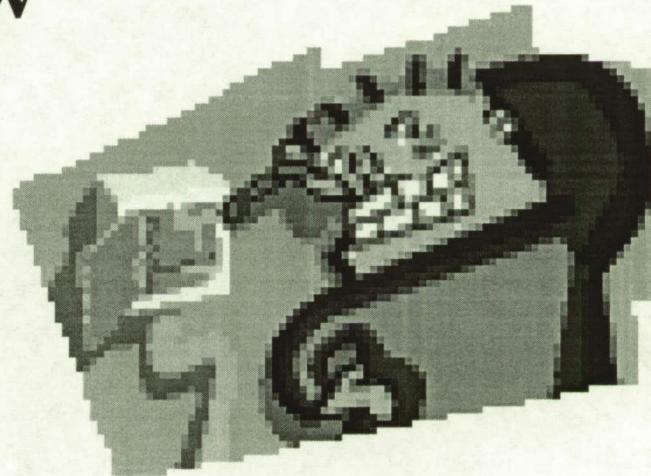
- Review weekly reports
- Assess how diligent the contractor is keeping systems in service



# **Investigation/ Analysis of Unscheduled Outages**

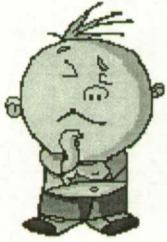
## **GOAL SIX METRIC REVIEW**

**Goal Six Metric is used to  
Measure the Contractor's  
Compliance with  
\*Performance Standard 2.2.1-1**



**\*Critical and/or Mission Essential F/S/E/U shall be ready to the user 100% of the  
Time from Call to Station until the mission milestone is complete or cancelled.**



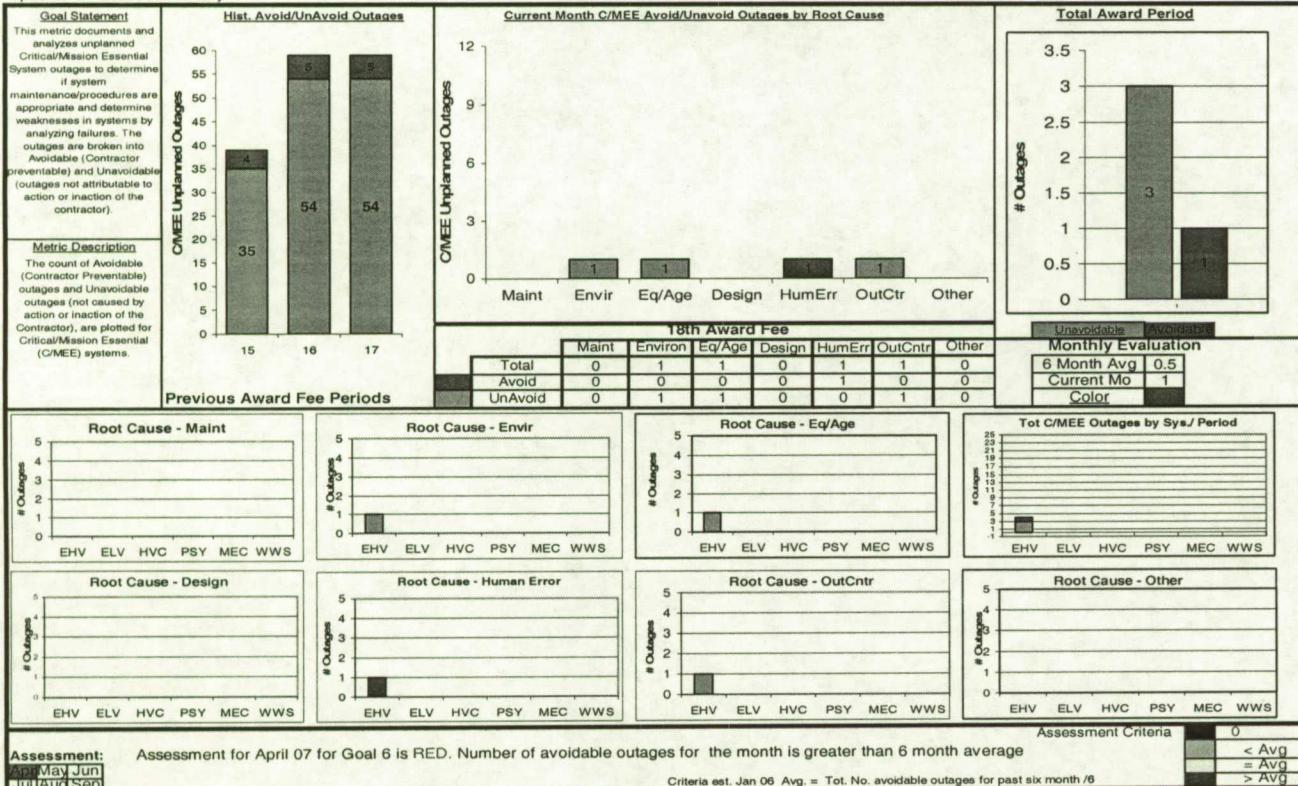


# Methodology

## Goal 6 Metric

Following the Graphical portion of the Metric is a Brief Summary that Provides:

POC: Ray Tuttle, SGS & Jose Mojica, CCSMO  
Updated & Assessed Monthly



- Anomaly Number
- ERCA ID
- Owner
- Date of Incident
- System
- Anomaly Description
- Root Cause
- What Failed
- Root Cause Category
- Avoided Y/N
- Need Analysis
- How Mitigated
- Corrective Action
- Comments
- Status



Reviewed & Evaluated May, April, June, & July

# Methodology Con't

- Outages Investigated
- “XY” Building
- AF Cafeteria
- FSA-3, 1360, 1635, 62630
- Cx 39 Pad A & B
- Contractor's Method To
- Populate Goal Six Metric:
- Review Anomaly Report
  - Initial Report
- Review ERCA
  - Generated by Anomaly Report
- Review Utility Outage And Incident Report
  - AF Only
- Hold A FERB
  - Once a month, discuss outages mostly regarding splices, relays, etc.
- Hold A High Voltage Meeting
  - AF Only
  - IPT's
  - Play a Role in Accepting the Metric



# The Air Force Communication Range Building Outage

\*Reflected for May Metric

## “XY” Building

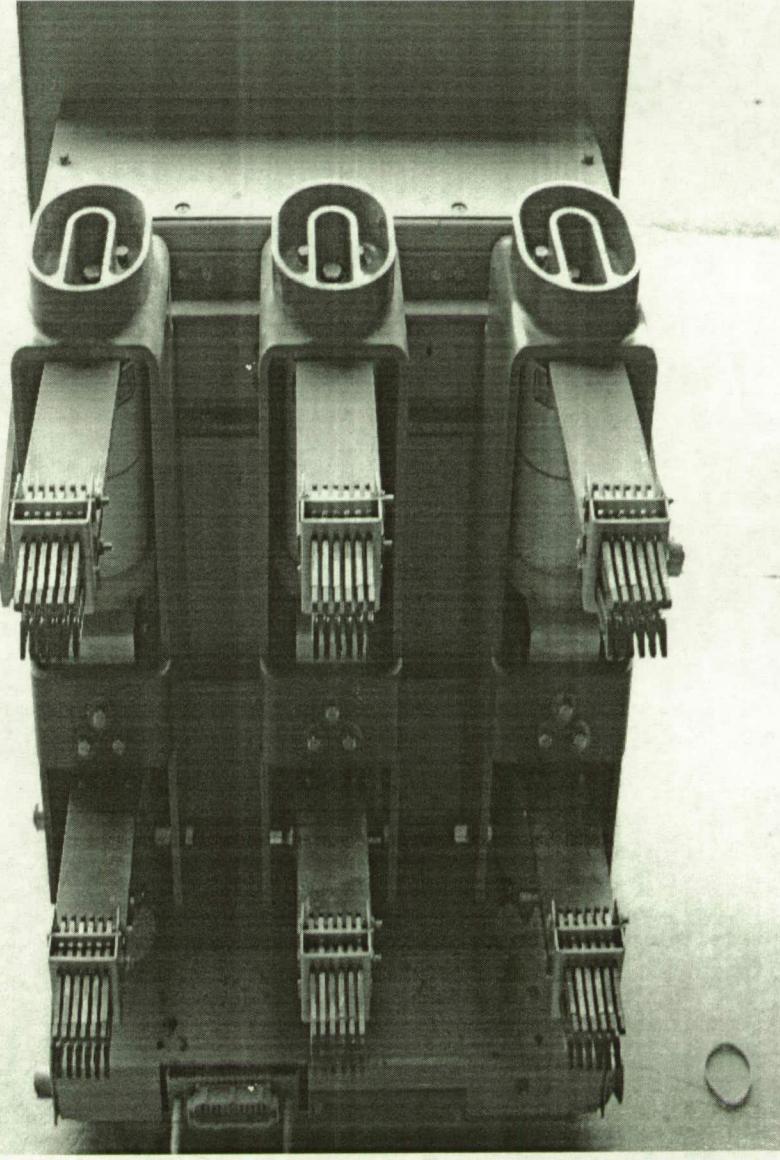
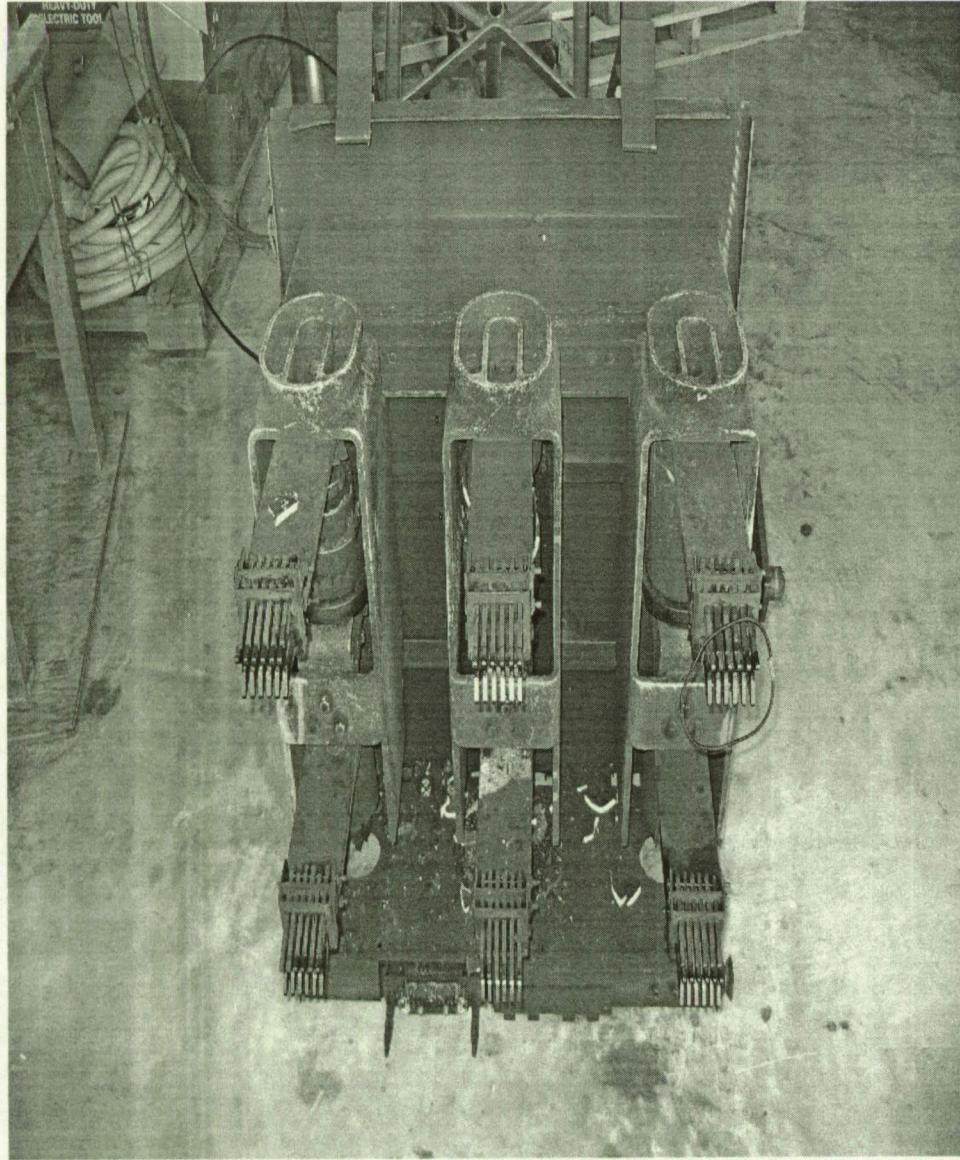
**Date:** May 21, 2007

**Root Cause:** Fault at the Primary Automatic Transfer ( ATS) that resulted in loss of power

**Contributing Cause:** As a result of a fault at the South Substation, which was created by FLP during a routine testing on their 115kV protective circuits



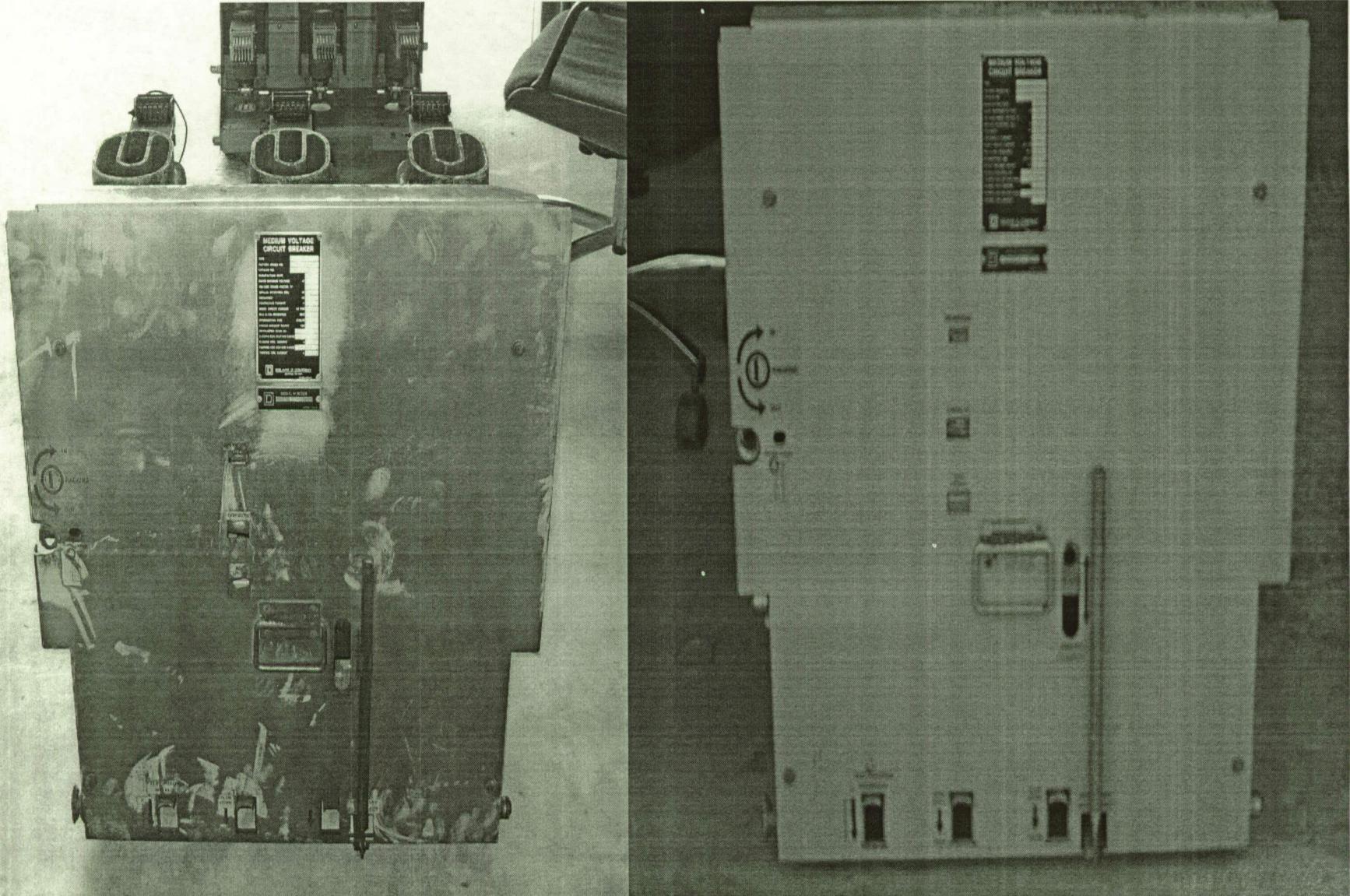
# The Air Force Communication Range Building Outage



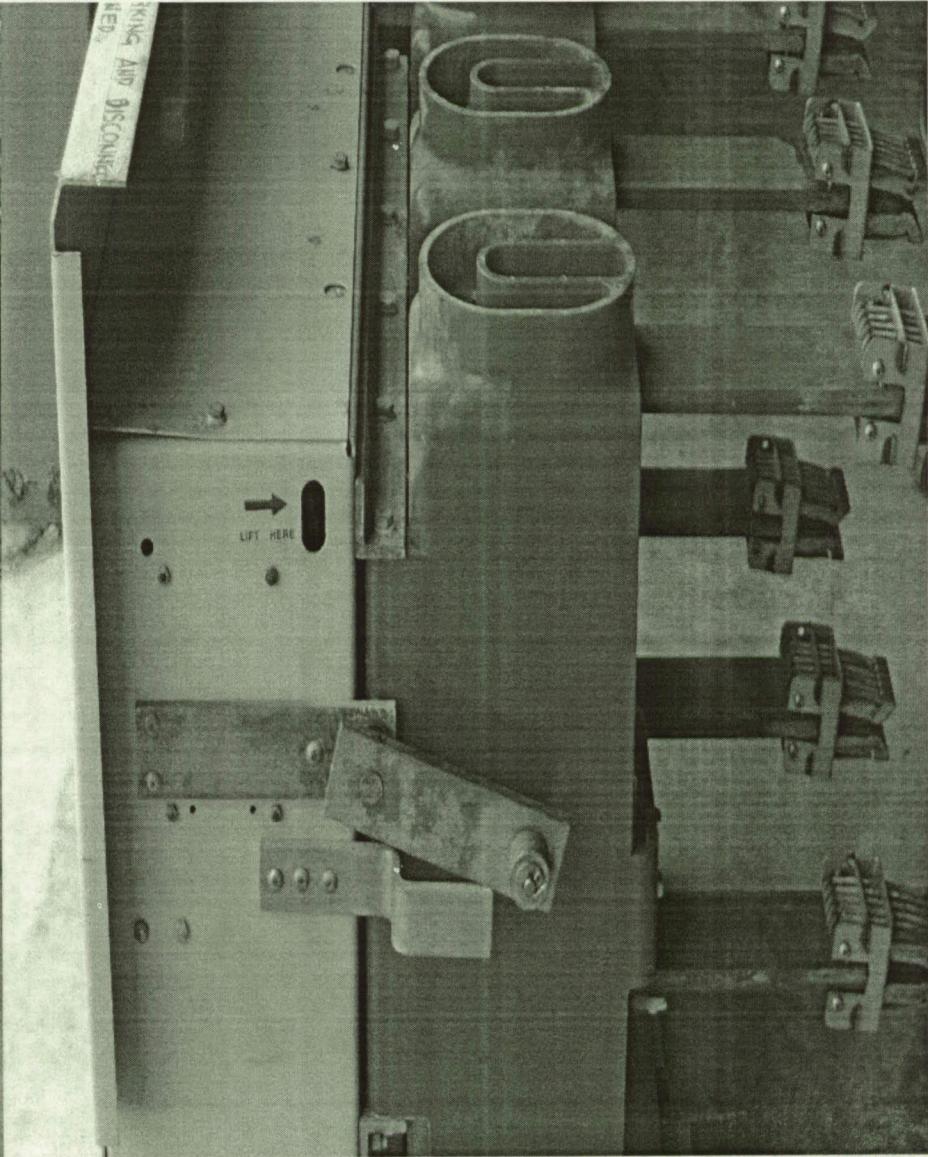
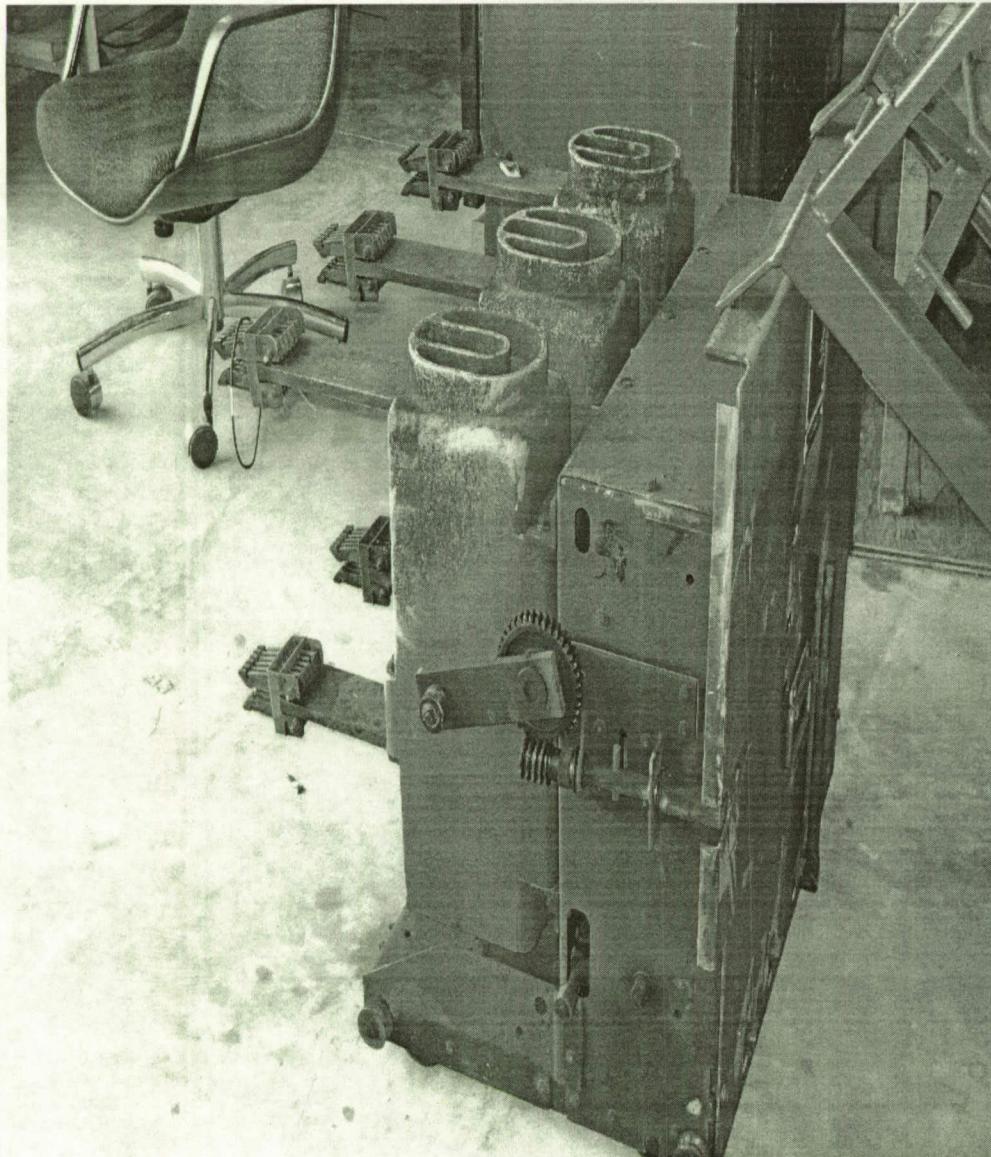
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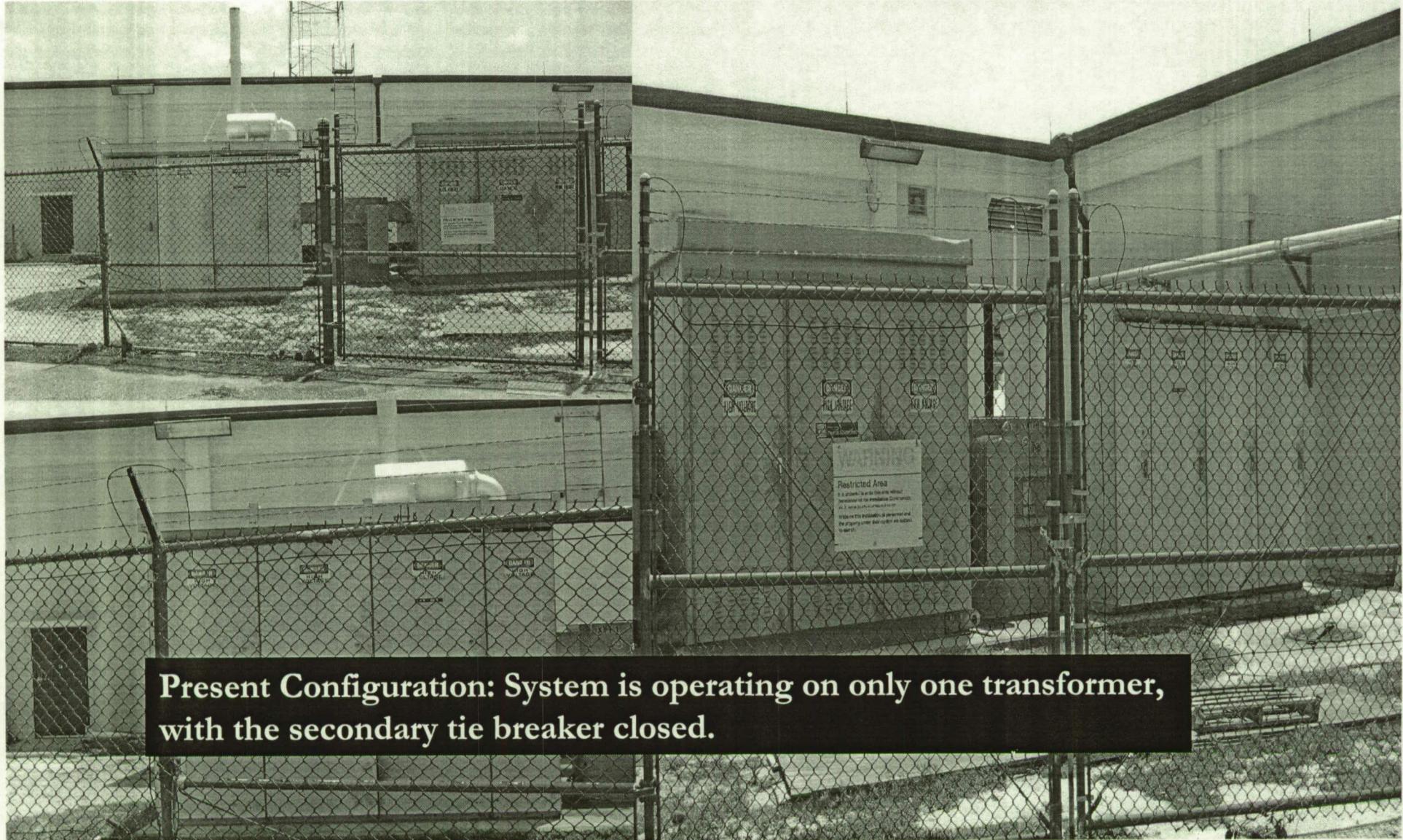
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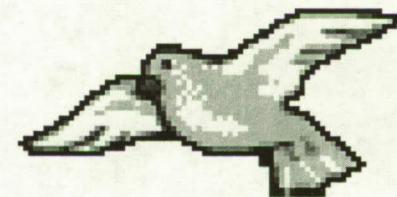
# The Air Force Communication Range Building Outage



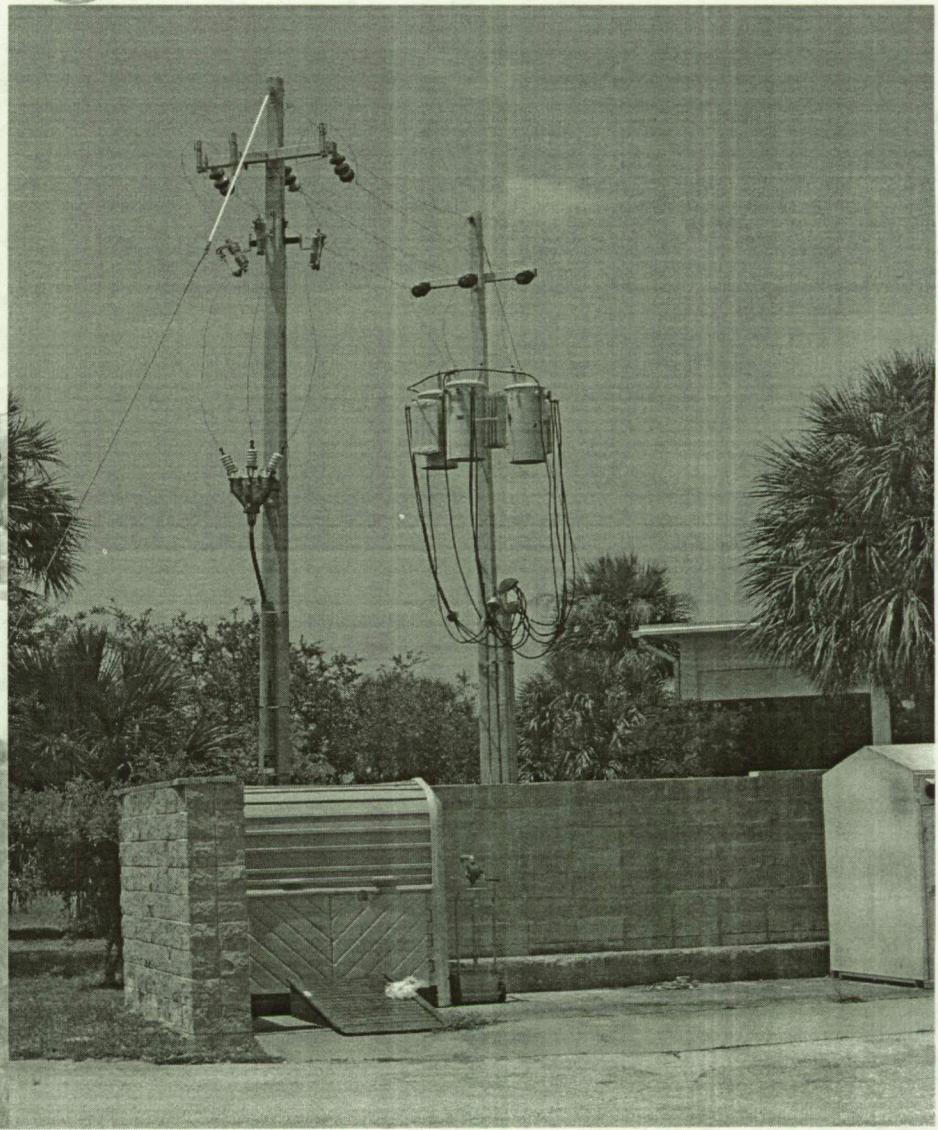
# USAF Cafeteria Outage

\* Reflected on June Metric

- **Date:** June 6, 2007
- **Root Cause:** Blown fuses on pole A110-8IF and A110-7IF. Two vultures created contact with the energized power lines causing a short circuit.
- **Contributing Cause:** A cafeteria dumpster is located very close to poles A110-8IF and A110-7IF. The dumpster attracts a large number of birds, which results in them coming in contact with the power line .

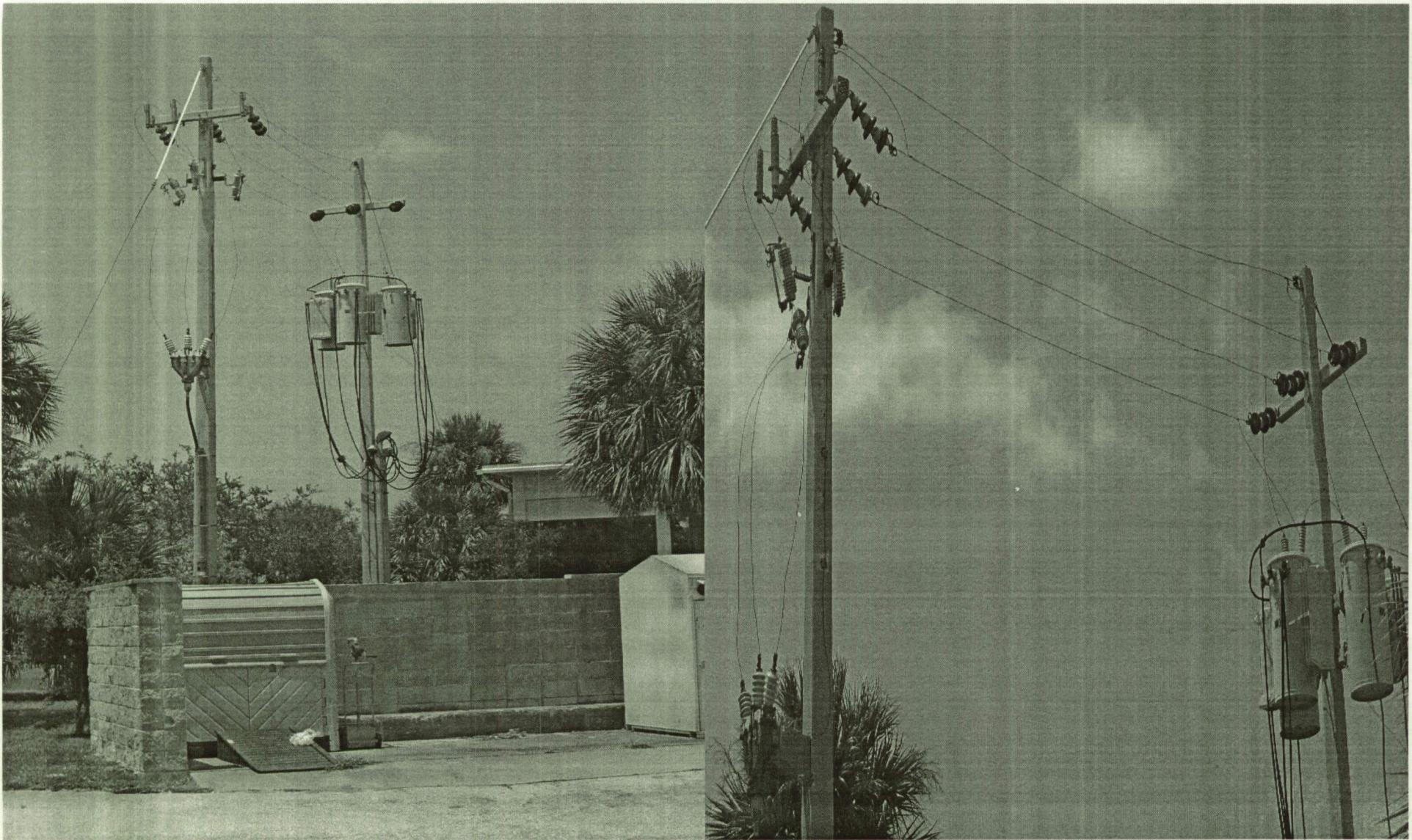


# USAF Cafeteria Outage



# USAF Cafeteria

## Outage



# USAF Cafeteria

## Outage



**Corrective Action:** The dumpster has been moved to the back end of the parking lot, and the contractor plans to reframe the poles and cover them with animal guard.

# FSA-3, 1360, 1635, 62630

## Outage

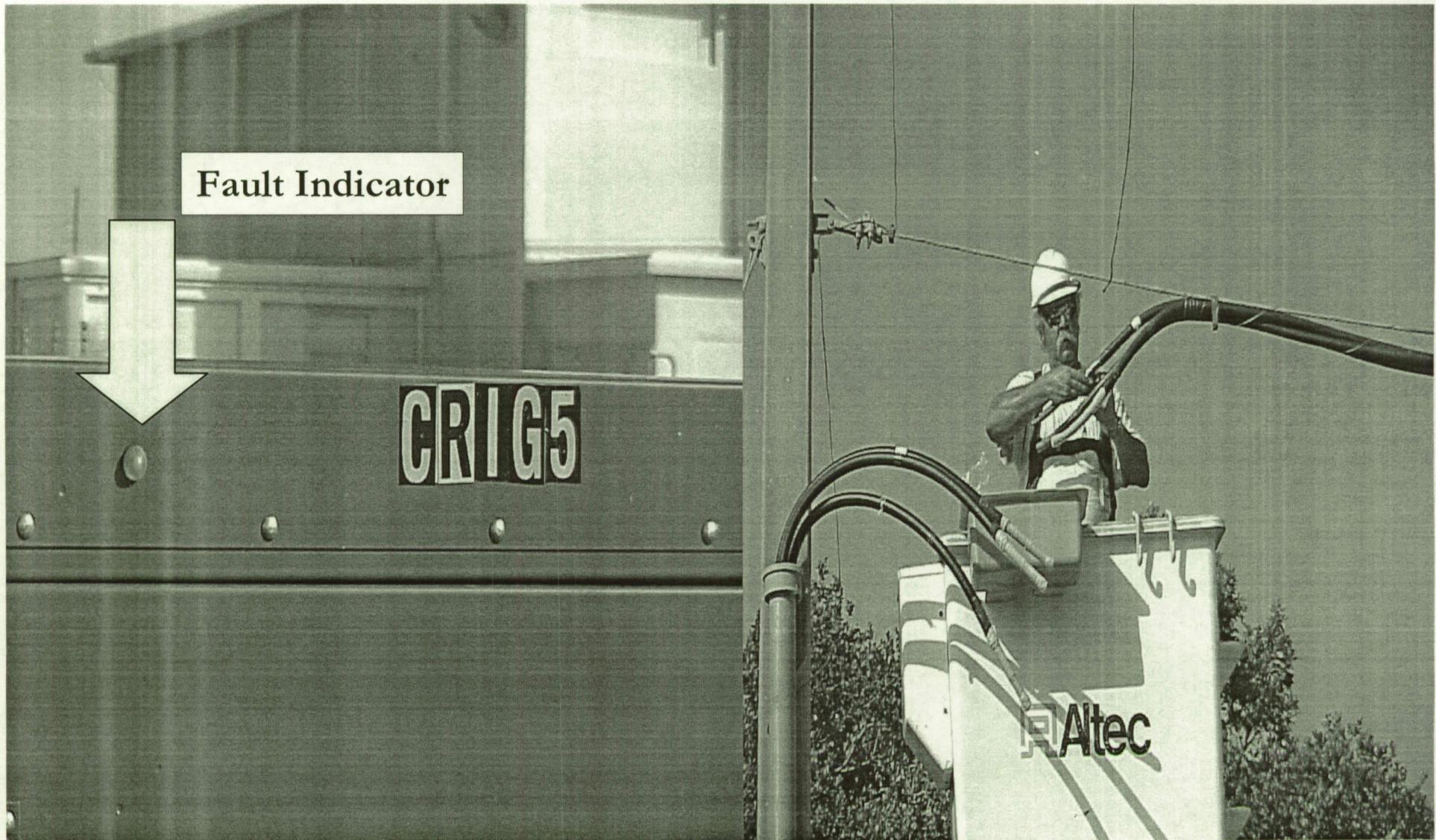
\*Reflected June Metric

- **Date:** June 18, 2007
- **Root Cause:** Under ground cable fault between two switches (CCIG4 Pos. 5 and CX36IGT5 Pos. 1)
- **Contributing Cause:** Improperly assembled aerial splice feeding under ground line. This aerial splice was made by AF contractor not under control of JBOSC.



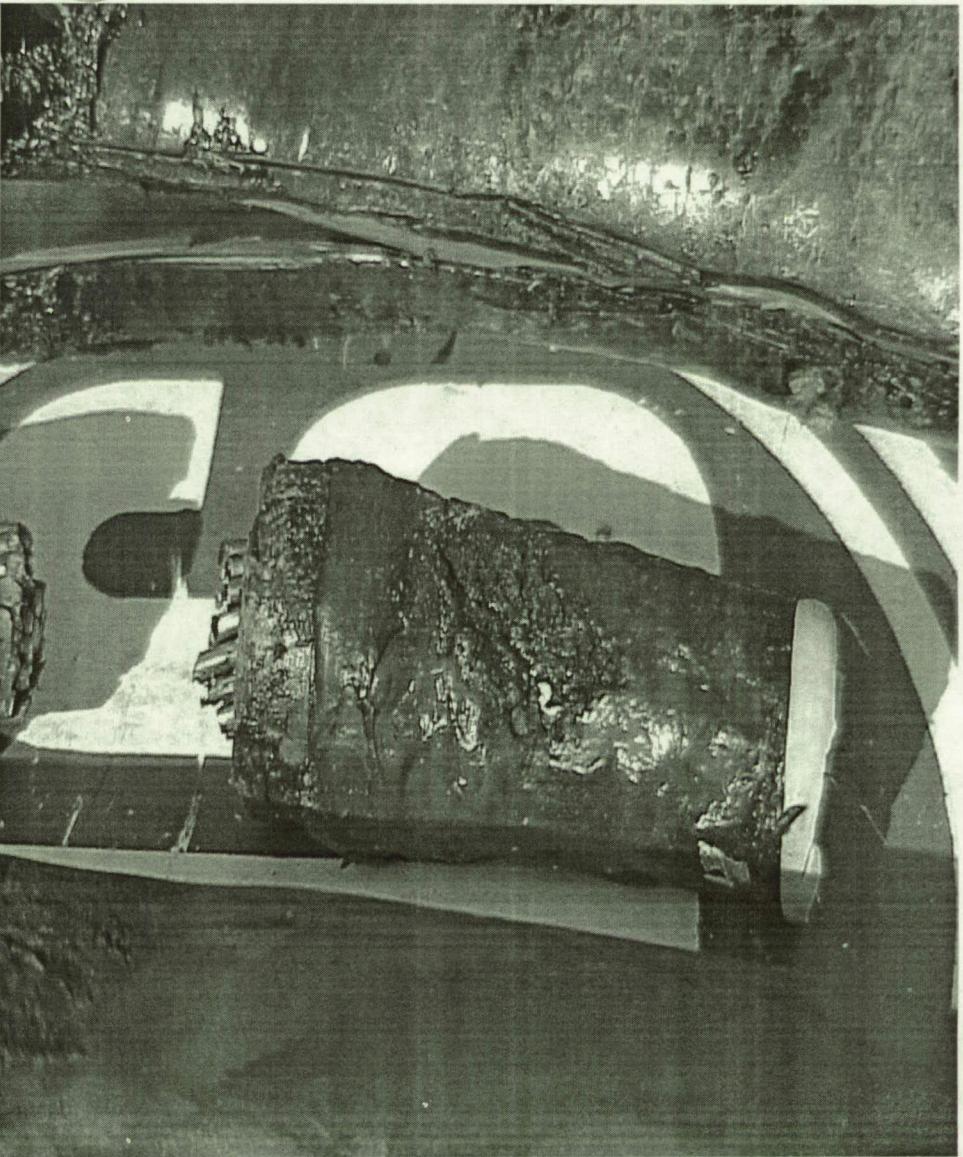
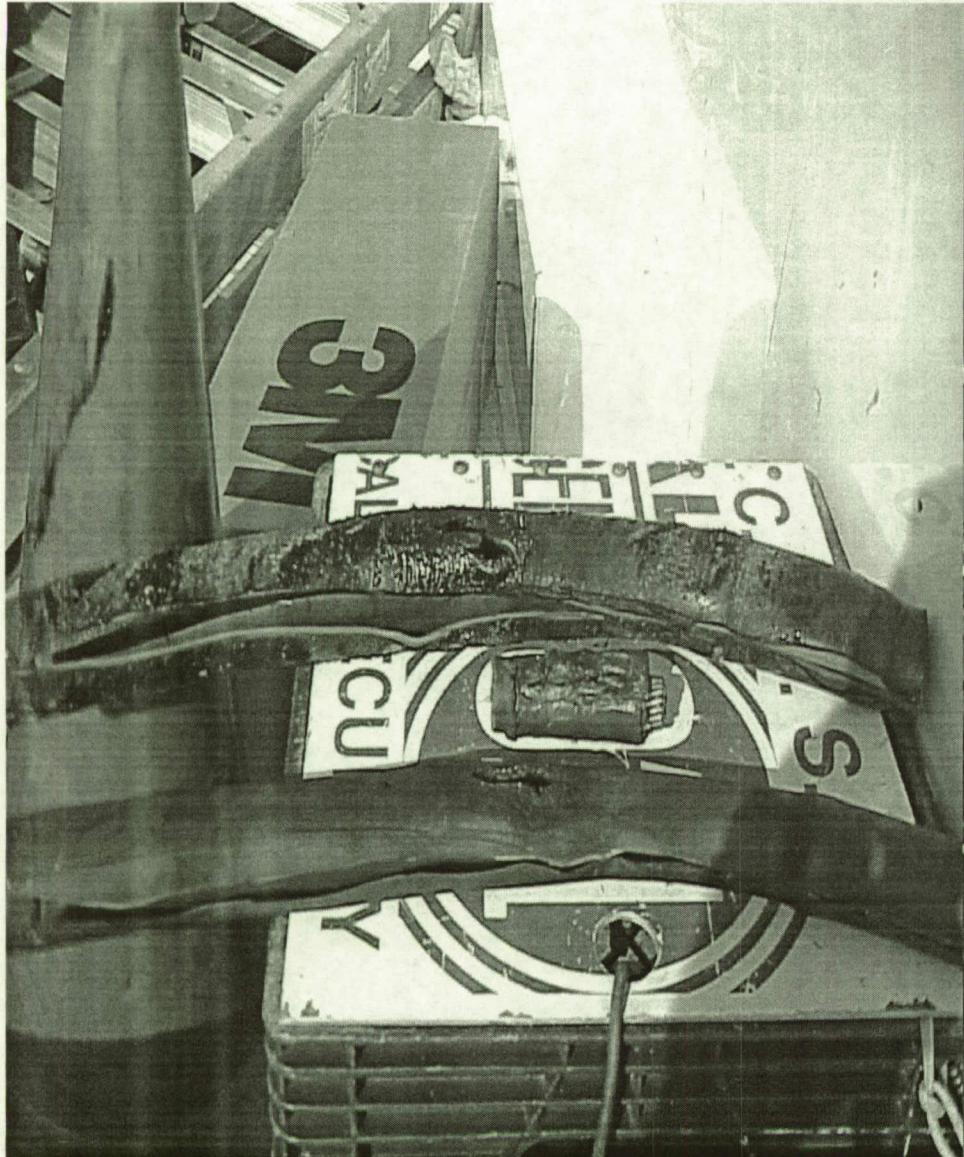
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## Outage



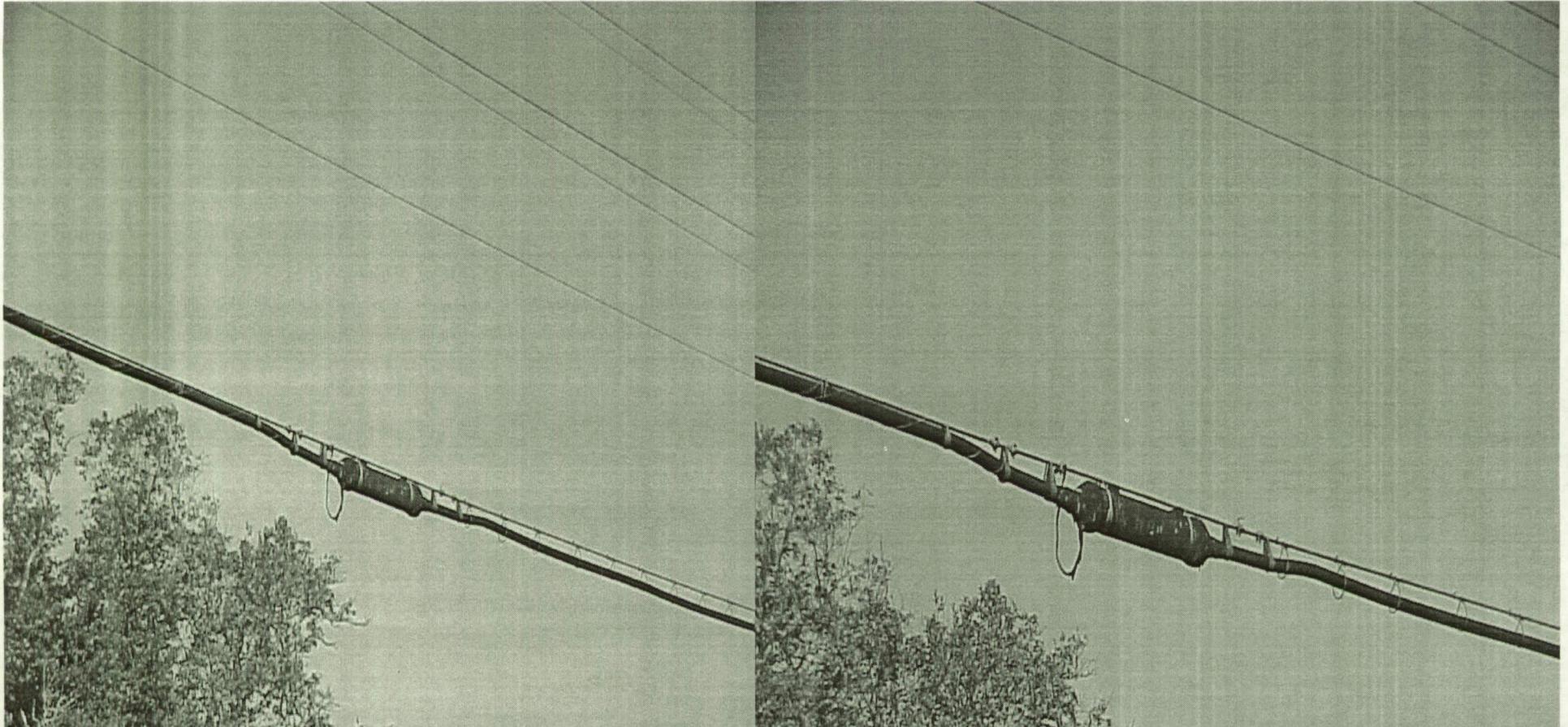
# FSA-3, 1360, 1635, 62630

## Outage



# FSA-3, 1360, 1635, 62630

## Outage

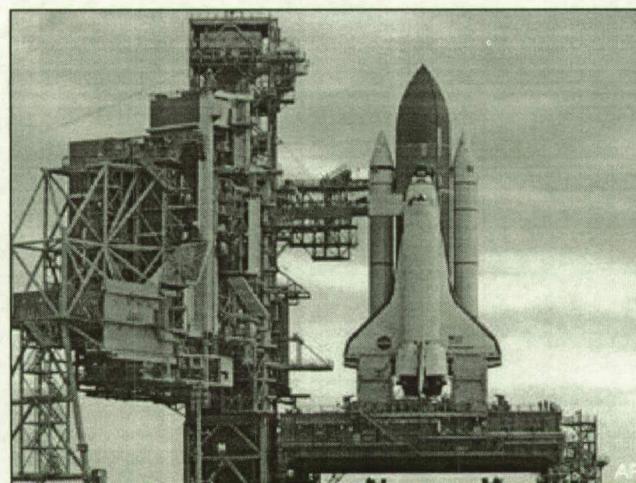


**Corrective Action:** Crew replaced defective splice, as well as replaced the other two splices on the pole to prevent any future occurrences of the same nature.

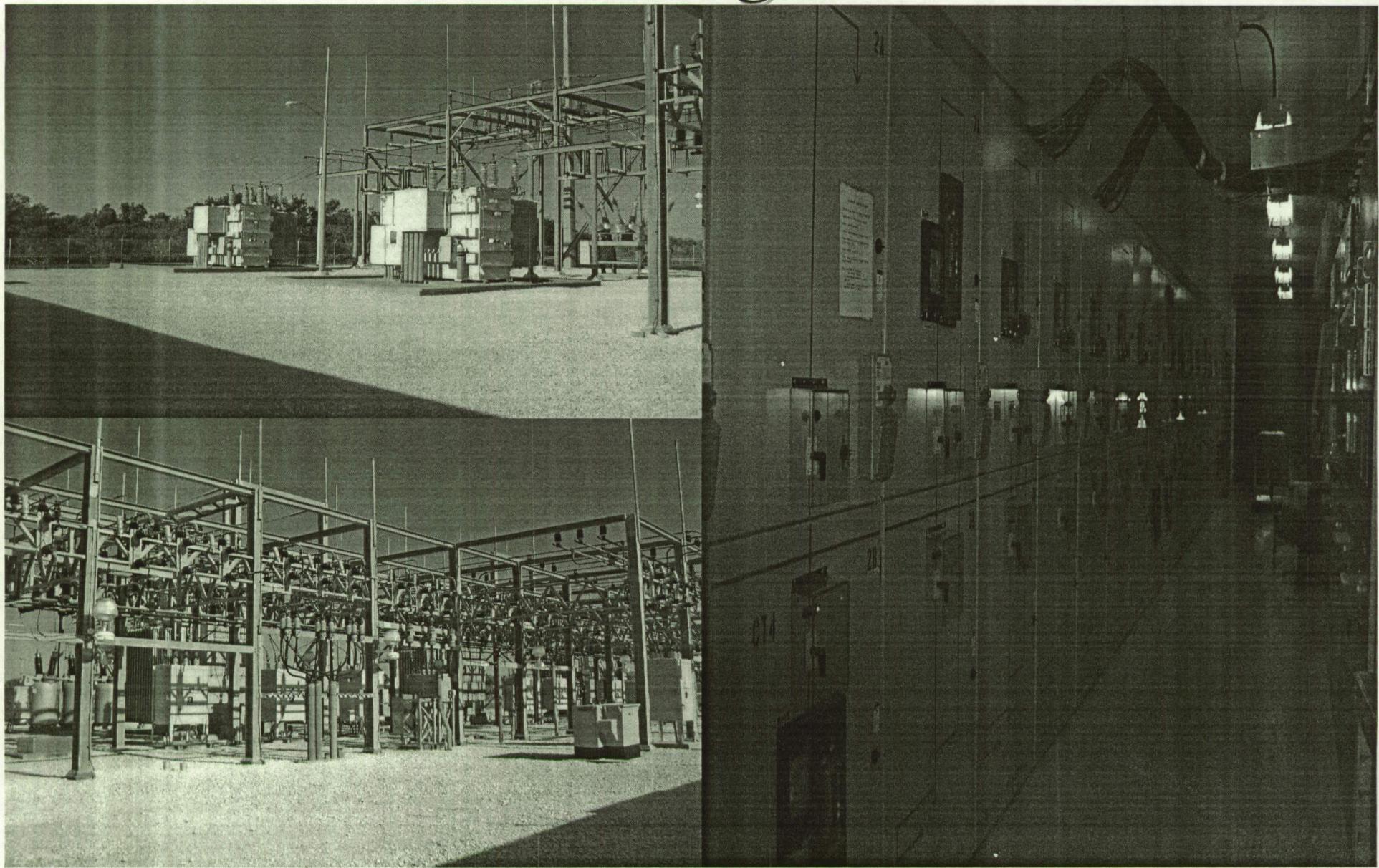
# Complex 39 Pad A & B Outage

\*Reflected on April Metric

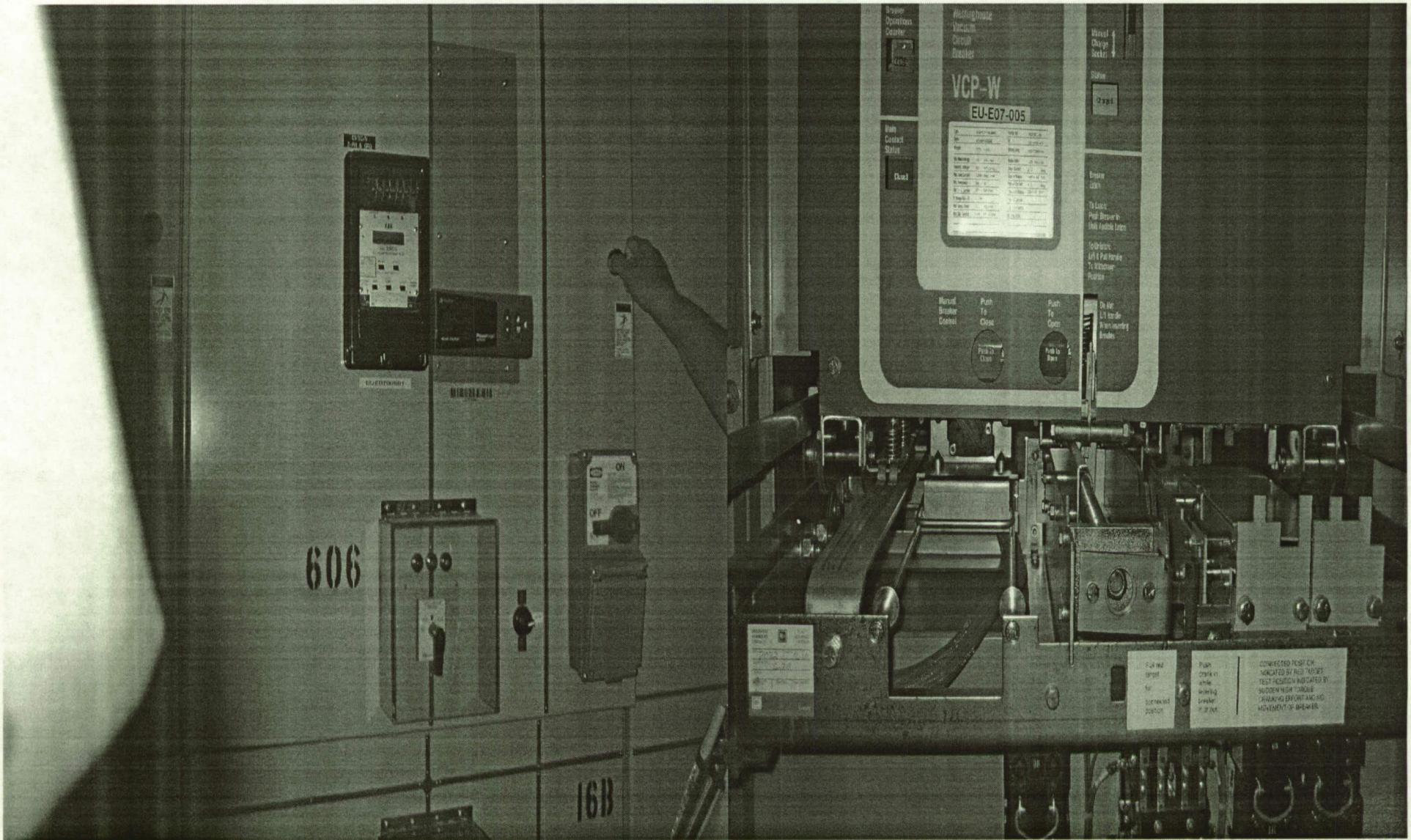
- **Date:** April 8, 2007
- **Root Cause:** Loss of power on feeder 606 from C-5 switch station.
- **Contributing Cause:** A fault on “B” phase from C-5 switch station to switch 900 due to a defective cable splice.



# Complex 39 Pad A & B Outage



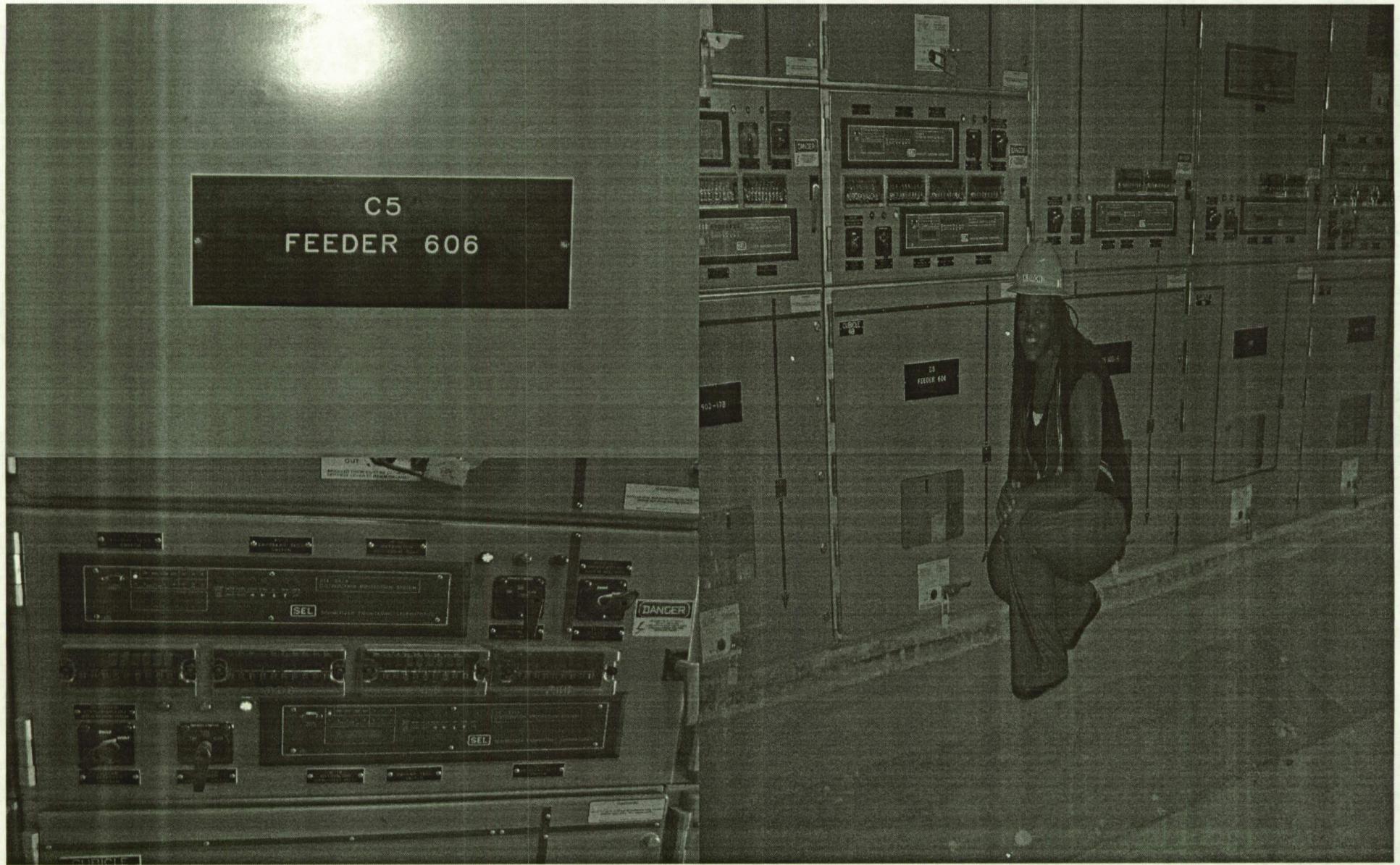
# Complex 39 Pad A & B Outage



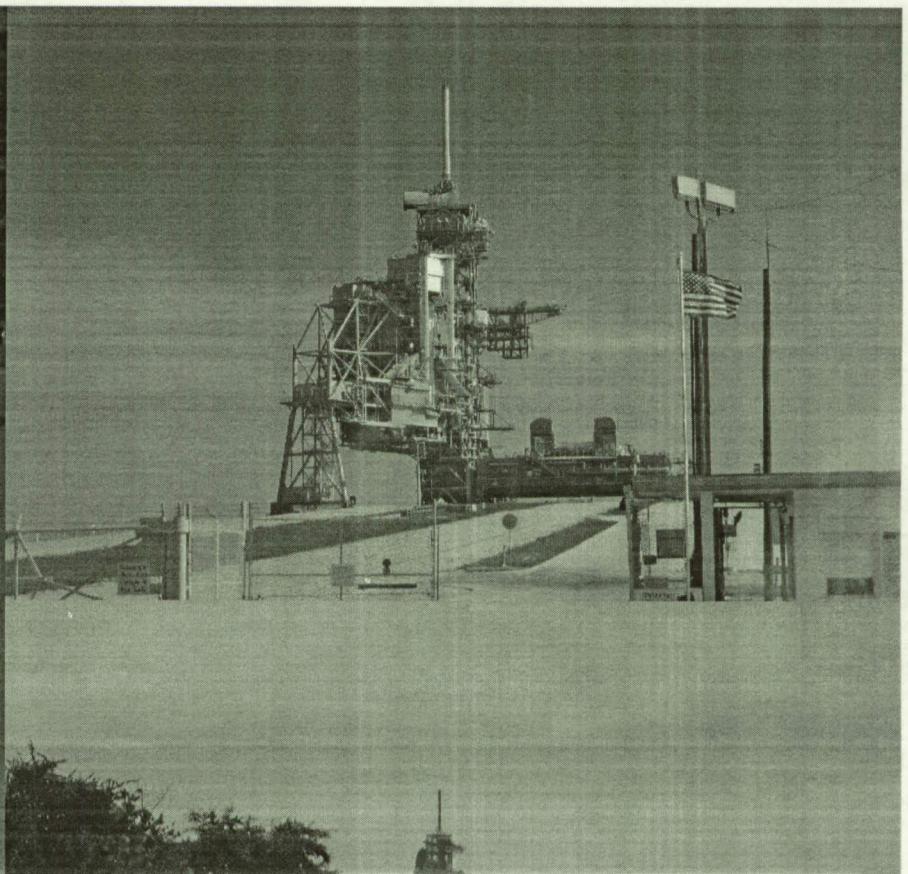
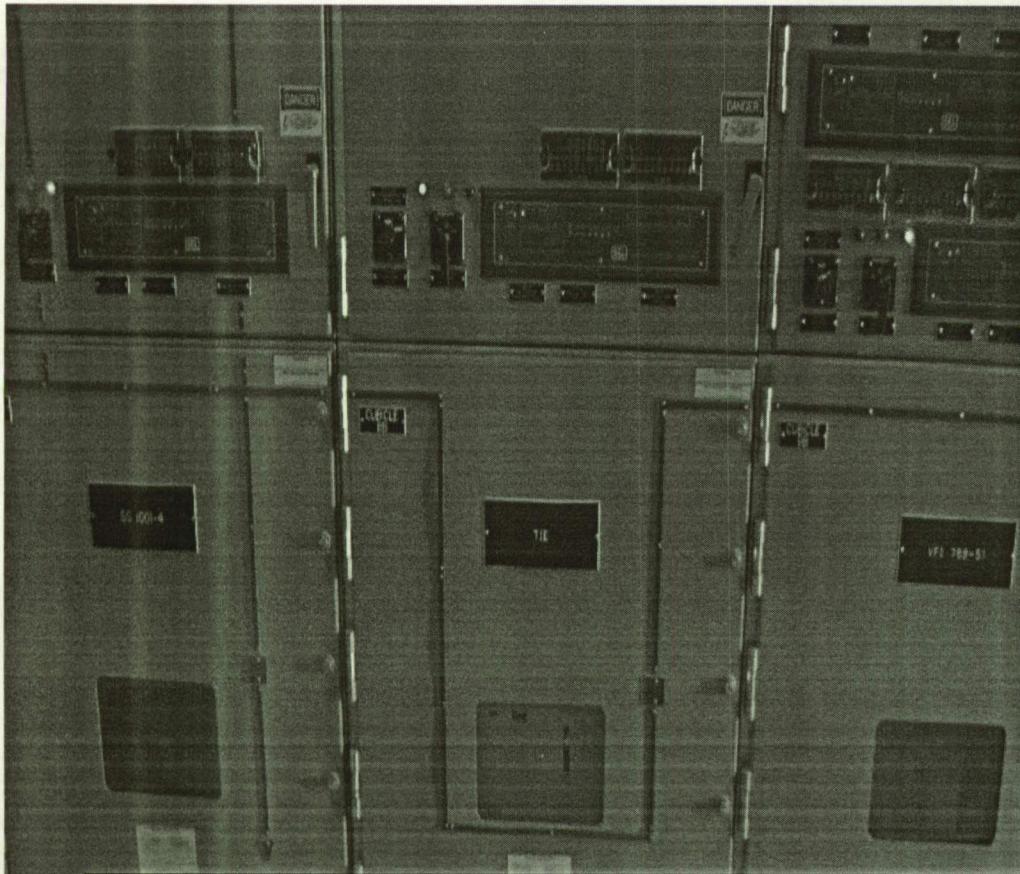
# Complex 39 Pad A & B Outage



# Complex 39 Pad A & B Outage



# Complex 39 Pad A & B Outage



**Corrective Action:** Switchman isolated Feeder 606 and closed Tie Breaker at switch station 900 and placed Pad A and B to Feeder 612 . Furthermore they cut all three old splices and respliced all three phases of cable for feeder 606 in manhole

# Conclusion

## Goal 6 Metric

Through the varies procedures and formal discussions the contractor is providing the customers a good product regarding the analysis of outages and determination of “availability”

### Recommendations

#### Pass Or Fail Rating System



Based on the Performance Standard the contractor must have all critical and mission essential equipment available 100% of the time.

#### PMI Status Column

The contractor would state whether the equipment's PMI is up to date (Yes/No) or whether the equipment is run to fail (N/A)

#### Written Procedure



A step by step procedure explaining how to populate Goal Six Metric (audit)

# Electrical Metrics Surveillance



## 2.2.1-3 False Fire Alarms and Evacuation

## 2.2.1-13 Preventive Maintenance of Fire Alarm Systems

### Deferral Process





# Methodology

## 2.2.1-3 False Fire Alarms and Evacuation

**Performance Standard 2.2.1-3 :** No more than 20 false fire alarms per month or 13 facility evacuations shall occur per month resulting from O/M/E attributed action/inaction of the contractor.

### Exceptions:

- Weather intrusion that could not have been prevented by base operation maintenance



- Outside Contractors influence not controlled through base operation contraction monitors



- Accidental activations by others (Not on the base operation contract)

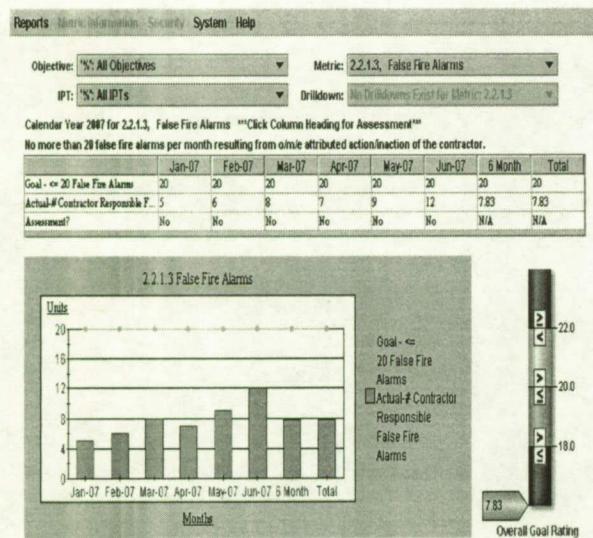


- An alarm that occurs during off hours and does not impact personal is not counted as an evacuation



# Methodology Con't

## Contractors Methods to Populate Metric



### Metric 2.2.1-3

- Contractor Reviews NFIRS Report (National Fire Incident Report System)
  - Creates a Report composed of All False Fire Alarms for Current Month
  - Classifies each Incident by Cause (i.e. weather, equipment failure,etc.)
- Contractor Sends Report to Fire Marshall for Approval
  - Fire Marshall makes Government Assessment based on Contract Exceptions
- Send Report Comments back to Contractor
  - Contractor populates Metric



# Conclusion

## 2.2.1-3 False Fire Alarms and Evacuation

As a result of Government Assessment 2.2.1-3 metric's exceptions are being applied correctly to the Metric



### Recommendation:

### List of Responsible False Fire Alarms

A small spreadsheet that shows the facility, date of incident, and primary cause

### Written Procedure

A step by step procedure to populate metric



# Methodology

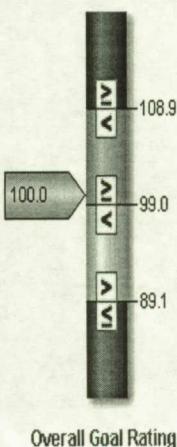
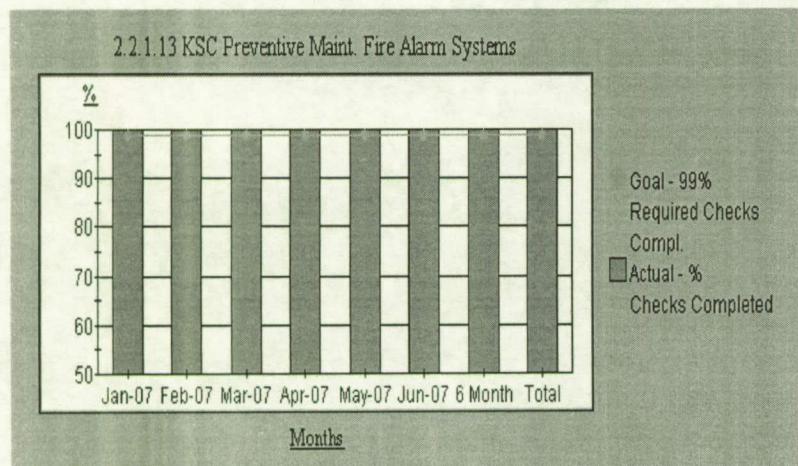
## 2.2.1-13 Preventive Maintenance of Fire Alarm Systems Deferral Process

Reports Metric Information Security System Help

Objective: "%: All Objectives" Metric: 2.2.1.13, KSC Preventive Maint. Fire Alar...  
IPT: "%: All IPTs" Drilldown: No Drilldowns Exist for Metric: 2.2.1.13

Calendar Year 2007 for 2.2.1.13, KSC Preventive Maint. Fire Alarm Systems \*\*\*Click Column Heading for Assessment\*\*\*  
This metric will measure 99% of the number of required preventive maintenance checks performed vs number of actual checks ...

	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	6 Month	Total
Goal - 99% Required C...	99	99	99	99	99	99	99	99
Actual - % Checks Co...	100	100	100	100	100	100	100.00	100.00
# Required Checks	23	35	31	37	29	21	176	176
# Required Checks Com...	23	35	31	37	29	21	176	176
# Required Checks Not ...	0	0	0	0	0	0	0	0
Assessment?	No	No	No	No	No	No	N/A	N/A



## Performance Standard

2.2.1-13:  
100% completion of all  
NFPA code-required and life  
Safety maintenance





# Methodology Con't

## Contractors Methods For Deferral Approval

- Shop Supervisor submits a deferral approval form\* to customer
- Supervisor proceeds to reschedule PM (creates a new TCD, leaves Won open with a deferred status)
- Customer signs deferral papers to approve



\*Documented Deferral Process Approvals were just created by contractors in Jan-Feb time frame...Before there were only verbal approvals

# Conclusion

- The Contractor is **effectively coordinating PM deferrals** with the customer in a **timely fashion NOW**
  - The New Process allows the customer to document approvals
- The Deferrals are **properly being reflected** on the 2.2.1-13 Preventive Maintenance of Fire Alarm Systems Metric
  - As a result of the new process the won has to stay open until the preventive maintenance is complete

## Recommendations

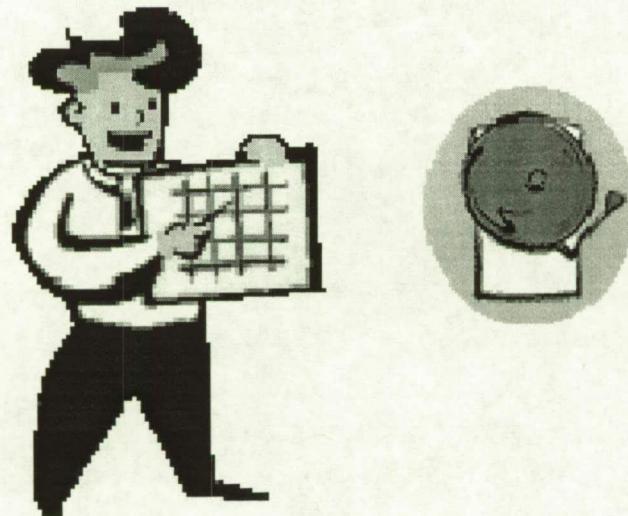
### Specific Deferral Process

A Deferral Process that is specific for each area (i.e. fire alarm, high voltage, etc.)



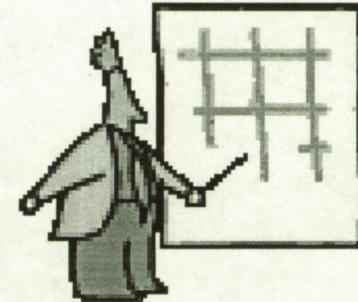
# Fire Alarm/Suppression Availability

## Fire Alarm and Suppression System Impairment Report



# Fire Alarm and Suppression System Report

- Government Requested Report
- Non DRD or contract obligation
- Report illustrates Facilities that have one or more Fire Alarm/and or Fire Suppression Systems out of service
- Impairment Systems are Categorized by Types of Work  
(i.e. type 2C, type 3C,etc.)



# Fire Alarm and Suppression System Report

**FIRE ALARM & SUPPRESSION SYSTEMS** (Items listed pertain to JBOSC assigned systems only) - Details of Outages are available on a shared network drive. The location path is as follows: Network Neighborhood /Kscboc2/Share/Jbosc/Sgs/Protective Systems/Systems. Then drag the Shortcuts ("Shortcut to KSC.mdb" and "Shortcut to CCAS.mdb") to your desktop.

IMPORTANT NOTE: If you have Office 95, you will not be able to open these files because they have been converted to the 2000 format. Contact your PC coordinator to obtain the required Office upgrade. Call Jim Lesky @ 861-6331 for any assistance.

A ECD/ STATUS of "PA =Pending Action" /" CS =Contractor Support"/" \$\$ HOLD" have ECDs that are projected or actual completion dates that are not determined and/or set by SGS).

Facilities that have one or more Fire Alarm and/or Fire Suppression Systems out of service are listed below. Applicable system impairment and occupant notifications have been made.

Information is based on realtime update from SGS JCCC and applicable shop in accordance with Protective Systems procedure PPS-I-0007. POC: KSC - Ed Byczek

## IMPAIRMENTS (Repair/Corrective action) Type 2C, 2I, 2PG

### KSC Fire Detection/Suppression

SYSTEM	FACILITY	OPERATIONAL STATUS	ECD/STATUS	START	WON#	COMMENT
FIRE SUPPRESSION	CT-2	OUT OF SERVICE	1/31/07	1/4/07	772523-1	USA Impairment – System Maintenance recharging nitroge cylinders
<b>KSC IMPAIRMENTS WITH ACTION PENDING (Long term) TYPES 3C, 3I, 4, 4.0, 5, 6, 7</b>						
FIRE ALARM	J6-2466	PARTIALLY DISABLED				
FIRE ALARM	J6-2375	PARTIALLY DISABLED				
FIRE ALARM	K6-848D	PARTIALLY DISABLED				
FIRE ALARM	K6-1350	PARTIALLY DISABLED				
FIRE ALARM	K7-140	PARTIALLY DISABLED				
FIRE ALARM	K7-367	OUT OF SERVICE				
FIRE ALARM	M6-213	PARTIALLY DISABLED				
FIRE ALARM	M6-399	PARTIALLY DISABLED				
FIRE ALARM	M6-458	PARTIALLY DISABLED				
FIRE ALARM	M6-698	PARTIALLY DISABLED				
FIRE ALARM	M6-883	PARTIALLY DISABLED				
<b>SYSTEM</b> <b>FACILITY</b> <b>SYSTEM IMPACT/STATUS</b> <b>ECD</b> <b>INITIATED</b> <b>PROJECT WON #</b> <b>COMMENTS</b>						
FIRE ALARM	J6-1924	PARTIALLY DISABLED	PA by AHJ & TA	6/20/06	10376532	Duct Detectors Disabled – WORKING WITH AHJ/T.A – 6/28/06
FIRE ALARM	J7-243B	OUT OF SERVICE		9/14/07	10084435	Back-up generator damaged FA system which repaired by the shi System will remain turned off in support of facility modifications p engineering direction
FIRE ALARM	K6-894	PARTIALLY DISABLED	6/18/07	5/21/07	10402468	Manual pull station relocation
FIRE SUPPRESSION	K6-900	OUT OF SERVICE	4/2/007	9/27/05	C0353SES	Construction Support, 2PTUD conversion to new JCCC
FIRE SUPPRESSION	K6-900	OUT OF SERVICE	PA	7/19/06	10164925	3P1, 3P1A, 3P15 – Unable to normalize Halon panel – System to be replaced under Type 3
FIRE SUPPRESSION	K6-900	OUT OF SERVICE	PA	7/19/06	10164929	3P2, 3P2A – Unable to normalize Halon panel – System to be replaced under Type 3
FIRE ALARM	K6-1096	PARTIALLY DISABLED	8/16/07	7/16/07	00304930	Support rest room mods
FIRE ALARM	K6-1193	PARTIALLY DISABLED	WGOVDI	3/7/04	10153070	Smoke Detectors in vault area disabled – moisture problem Waitir Government Disposition
FIRE SUPPRESSION	K6-1547	PARTIALLY DISABLED	5 YR Plan	06/20/2005	10278237	Sprinkler system leaking – Type 3 requested – WPLN 07/20/05 PER RANDY SEWARD, SR PROCESS COMPLETED, IN E RPL STATUS UNTIL 1509/1510 INITIATED/COMPLETED; ZS (5 Y PLAN)
FIRE ALARM	K7-416B	PARTIALLY DISABLED	PA	2/9/06	10339560	Defective Power supply-To old for upgrade- Type 3 to upgrade 11/03/06 REPLACE EDWARDS FIRE ALARM SYSTEM WITH NEW PSYFA SYSTEM SR #4 (FORMERLY ON WON 10086016 in FDE
FIRE ALARM	M3-0002	PARTIALLY DISABLED	CS	4/3/02	10081730	Local reporting Only – Bldg. to be replaced – NASTO-99052(B) PCI 98462
FIRE ALARM	M5-1595	PARTIALLY DISABLED	\$\$HOLD	2/15/01	00190786	WON on \$\$ Hold CO2 suppression system disconnected
FIRE ALARM	M5-1695	PARTIALLY DISABLED	\$\$HOLD	3/15/04	00190788	System reprogram for silent alarm - shop task
FIRE ALARM	M6-138	OUT OF SERVICE	CS	10/03/05	C0327000	Support contractor in fire system modifications
FIRE ALARM	M6-342	PARTIALLY DISABLED	PA	11/23/05	10362564	PVC conduit broken-to be replaced-Duct Detector wiring lifted due ground faults (old #10359052)
FIRE ALARM	M6-409H	OUT OF SERVICE	8/10/07	7/27/07	10364485	Contractor replacing fire alarm panel.
FIRE SUPPRESSION	M6-744	OUT OF SERVICE	\$\$ HOLD	3/07/05	10331997	Sprinkler System has Broken Pipe
FIRE ALARM	M6-794	PARTIALLY DISABLED	4/30/07	10/03/06	10203529	Fire Alarm system replacement by contractor. Ref 12035296
FIRE ALARM	M7-355	PARTIALLY DISABLED	CS	6/11/07	A1458614	1200 & 1400 (High Bay, Tunnel & south section) out of service to supp modifications (ECD 11/25/2008)
FIRE ALARM	M7-409	PARTIALLY DISABLED	4/27/07	6/5/06	10360464	Support AHU mods by contractor
FIRE ALARM	M7-409H	OUT OF SERVICE	8/10/07	7/27/07	10364485	Contractor replacing fire alarm panel
FIRE SUPPRESSION	M7-505A	OUT OF SERVICE	\$\$HOLD	9/23/2002	0114990A	7/2/04 WON # 0114990 submitted on hold for funding 03/18/03 RETURNING TO WORK CONTROL DUE TO BUDGET CONSTRAINTS PER MIKE CHRISWELL ON 03/04/03, WON TO BE PLACED ON \$\$ HOLD, JLT 3/15/07 STILL ON \$\$ HOLD



# Methodology

- Reviewed Impairment Report Daily
  - Tried to Obtain an understanding of the information on report
- Interviewed Electrical IPT Lead
- Interviewed Contractor that generates report
- Research Work Orders presented on Report
  - Found incorrect status and duplicate work orders
- Interviewed Customer



# Conclusion

- Contractor is diligently keeping systems in service based on finances
- Report is inconsistent and may cause confusion to those who are not directly working with these systems



## Recommendations

### Fire Alarm and Suppression System Impairment Database

- Allow user to view out of service fire alarm systems and work orders associated with them
- User Friendly



# Acknowledgements

- God
- Mrs. Kimberlyn Carter (My Mentor)
- Mr. Jose Mojica
- Integration Office
- Cape Canaveral Spaceport Management Office
- NASA MUST Program
- KSC Education Office
- Family & Friends

**THANK YOU !!!!!!**



# Questions

